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respects, should be placed on the same axis; and points out how, by means of such a compound needle, both the dip and intensity might be determined by independent methods, so that the agreement of the results would afford a test of the accuracy of the adjustments and of the observations. He considers that the knife-edge support, which has recently been adapted to a dipping needle, would be peculiarly applicable to a needle of this construction. The sensibility of such a needle would be much greater than that of any hitherto constructed, and the utmost delicacy would be required in the adjustments; but if the needle were accurately constructed, and due care were taken in the magnetizing, and in making the adjustments and observations, the author expects that the dip and intensity would be determined to a degree of certainty hitherto unattained.

The advantages proposed to be derived from the use of a dipping needle on the principle described in this paper, are, that as the dip would be obtained without inversion of the poles, the results would be less liable to error than when that operation is necessary, and the observations would be made in less than half the time usually required; and that a measure of the intensity of terrestrial magnetism would be obtained from the same observations which give the dip, the intensity of the force being thus always determined by means of the same needle, and at the same instant as its direction.

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April 25, 1833.

MARK ISAMBARD BRUNEL, Esq., Vice-President, in the Chair.

A paper was read, entitled, "An Account of an extraordinary luminous appearance in the Heavens, seen at Athboy in Ireland, on the 21st of March, 1833." By the Right Honourable the Earl of Darnley. Communicated by John George Children, Esq. Sec. R.S.

The noble author's house is situated in lat.  $53^{\circ} 37' N.$ , long.  $6^{\circ} 54' W.$  On the evening of the 21st of March last, at 9 p.m., a stream of luminous matter, reaching from the eastern to the western horizon, which it entered to the north of the constellation of Orion, was observed passing about midway between the Great Bear and Arcturus, and directly over the two principal stars of Gemini. The phenomenon was not accompanied by the usual flashings of an Aurora, but appeared to flow, when attentively observed, in a rapid stream from east to west, and varying in intensity in its course. His Lordship compares it to the stream from the pipe of an engine played over the head of a person standing under it, about the middle of its course.

The light was most brilliant at the eastern extremity of the arch, where it was about  $1^{\circ}$  wide, gradually increasing in width and diminishing in intensity as it approached the western extremity, where it may have occupied about  $5^{\circ}$  or  $6^{\circ}$ . Stars of the second and third magnitudes were distinctly visible through the arch, at least from the meridian to the western horizon; and though not apparently at a great elevation, light clouds occasionally seemed to pass between it

and the observer, obscuring its light. During twenty minutes that Lord Darnley observed the phenomenon, it seemed to proceed through its whole extent from north to south, its edges, which, when first observed, extended equally on either side of Castor and Pollux, having in that time entirely left the most northern of those stars. It had wholly disappeared before ten o'clock.

Lord Darnley did not see the beginning of the phenomenon ; but was informed that it appeared at first like the moon rising, and gradually extended from the eastern to the opposite horizon. The reflection thrown on the earth was faint : the degree and colour of the light may be compared to that of a comet ; of greater brilliancy, however, than any that has appeared in this century.

In a postscript, His Lordship states, that precisely the same appearance was observed at Castlereah, distant sixty miles ; and, according to a Carlisle paper, somewhere in the North of England ; the time of appearance in both cases corresponding very nearly with that of his own observation.

A paper was also read, entitled, "On the Magnetic Power of Soft Iron." By Mr. Francis Watkins. Communicated by Michael Faraday, Esq. D.C.L. F.R.S.

When free magnetism is developed by induction, and is not retained in that state by what has been termed the coercive force of hard steel, it has generally been considered that all the phenomena due to the existence of free magnetism cease on the removal of the inducing cause. The object of the present communication is to show that such is not the fact. From a variety of experiments described by the author, it appears that soft iron continued to exhibit strongly the attraction due to the developement of magnetism long after the means by which the magnetism had been originally excited had ceased to act. In these experiments, bars of soft iron, in the form of a horse-shoe, had a single helix of copper wire wound round them, so that on the ends of the wire being brought into contact with the poles of a voltaic battery, the iron became an electro-magnet. With one of these horse-shoes, while the connexion between the ends of the helix and the poles of the battery existed, the soft iron, having a keeper applied to its poles, supported 125 pounds ; it supported 56 pounds after that connexion had been broken, and continued to retain the power of supporting the same weight after an interval of several days, care having been taken not to disturb, during the time, the contact between the horse-shoe and its keeper. On this contact, however, being broken, nearly the whole attractive power appeared to be immediately lost. The author describes several instances of the same kind, particularly one in which the contact between the ends of the horse-shoe of soft iron and its keeper having been undisturbed during fifteen weeks, the attractive power continued undiminished. Although the interposition of a substance, such as mica or paper, between the ends of the horse-shoe and its keeper necessarily diminished the force of attraction, it did not appear to diminish the power of retaining that force. In a case where the electro-magnet of soft iron and its keeper were equal semi-circles, the author found, what may appear singular,